

3/15/04

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	Fritz LEBER
Serial no.	:	
For	:	HYDRODYNAMIC TORQUE CONVERTER
Docket	:	ZAHFRI P593US

MAIL STOP PATENT APPLICATION
The Commissioner for Patents
U.S. Patent & Trademark Office
P. O. Box 1450
Alexandria, VA 22313-1450

PRELIMINARY AMENDMENT

Dear Sir:

By way of preliminary amendment, please amend the above identified application as set forth below.

In the Specification:

Please amend paragraphs 002, 003, 004, 005, 009, 010, 014, 015, 021, 026 and 027 of the specification as follows in which the specification additions are shown by underlining and the specification deletions are shown by strikeout. Please enter the replacement specification paragraphs into the record of this case.

In the Claims:

Please cancel claims 1-9, without prejudice or disclaimer of the subject matter therein, in favor of new claims 10-18 as follows.

- [002] This application claims priority from German Application Serial ♦♦
 No. 103 14 335.1 filed March 28, 2003. ♦♦
- [003] FIELD OF THE INVENTION ♦♦
- [004] ~~According to the type precisely defined in the preamble of claim 1, the~~ ♦♦
 The invention relates to a hydrodynamic torque converter. ♦♦
- [005] BACKGROUND OF THE INVENTION ♦♦
- [009] ~~—— The problem is solved with a hydrodynamic converter according to the~~ ♦♦
 ~~preamble of the main claim and including also the characteristic features thereof.~~ ♦♦
- [010] SUMMARY OF THE INVENTION ♦♦
- [014] BRIEF DESCRIPTION OF THE DRAWINGS ♦♦
- [015] ~~Other features are to be understood from the description of the figures~~ ♦♦
 ~~which show~~ The invention will now be described, by way of example, with ♦♦
 reference to the accompanying drawings in which: ♦♦
- [021] DETAILED DESCRIPTION OF THE INVENTION ♦♦
- [026] Unlike the design described in Fig. 1 and 2, the torque converter in Fig.
 3 contains one pressure sensor 17 which determines the pressure acting upon
 the first piston area 4 and supplies it to an electronic control unit 18. The
 electronic control unit issues a signal to a proportional valve 19 and controls it
 according to a single rotational speed sensor 20 and nominal value settings 21
 and correction factors 22. The proportional valve 19 supplies the space 14 with ♦♦
 pressure medium and pressurizes the second piston area 5 in order to apply to
 the clutch 2 a defined force via the piston 3.

[027]

Fig. 4:

The converter housing 1 is connected with a prime mover (not shown) and driven. The primary clutch 2 connects the housing 1 with the pump impeller 6. The turbine impeller 7 can be connected, via a converter bridge clutch 23, with the housing 1. Upon the first piston area 4 acts the variable pressure within the housing which depends on the operational parameters and the operational state of the converter. The first piston area 4 and the space 10 are connected via the line 9 with a valve or control unit 11. The pressure of the space 10 can be detected via the line 9. While pressure medium is passed into the space 14, via the line 13, hydraulic pressure acts upon the second piston area 5. The resulting differential pressure from the pressure upon the first piston area 4 and the second piston area 5 actuates the piston 3. In order to supply the clutch 2 in the open state with lubricant, there is located in the piston 3 at least one aperture 24 through which lubricant can be passed through the discs of the clutch 2. It is possible to seal the space 14 by sealing elements 25. The outer discs of the clutch 2 are non-rotatably connected with the pump impeller 6, the inner discs of the clutch 2 being non-rotatably connected with the housing 1.

1-9. (CANCELED)

10. (NEW) A hydrodynamic torque converter having located in a housing (1) at least one clutch (2), an actuation device of which has at least one piston (3) and in which a hydraulic pressure within said housing (1) acts upon a first piston area (4) and a hydraulic pressure changeable by one control unit (11) acts upon a second piston area (5) wherein the hydraulic pressure acting upon said first piston (4) acts directly or indirectly upon said control unit (11) and said control unit (11) adjusts the hydraulic pressure upon said second piston area (5) depending on the hydraulic pressure upon said first piston area (4).

11. (NEW) The hydrodynamic torque converter according to claim 10, wherein one drive mechanism of said torque converter (1) is connectable via said at least one clutch (2) with one pump impeller (6) of said torque converter.

12. (NEW) The hydrodynamic torque converter according to claim 10, wherein said control unit (11) has one valve unit, a pressure medium supply of which is connected with a pressure medium acting upon said first piston area (4) and which depending on a nominal value setting (12) connects pressure medium acting upon said first piston area (4) with the pressure medium acting upon said second piston area (5).

13. (NEW) The hydrodynamic torque converter according to claim 10, wherein said control unit (11) has one valve unit a pressure medium supply (16) of which is connected with a pressure medium source, especially of a transmission pump which is connected with the pressure medium acting upon said first piston area (4) and which depending on a nominal value setting (12) and depending on the hydraulic pressure medium source with the pressure medium acting upon said second piston area.

14. (NEW) The hydrodynamic torque converter according to claim 10, wherein a pressure sensor (17) determines the hydraulic pressure acting upon said first piston area (4) and an electronic control unit (18) adjusts the hydraulic pressure acting upon said second piston area (5) depending on a nominal value setting.

15. (NEW) The hydrodynamic torque converter according to claim 14, wherein one rotational speed sensor (20) determines a rotational speed of a pump impeller (6) and said electronic control unit (18), depending on a rotational speed of said pump impeller (6), adjusts the pressure acting upon said first piston area (4) and a nominal speed setting the pressure acting upon said second piston area.

16. (NEW) The hydrodynamic torque converter according to claim 12, wherein a space (10) formed by said converter housing (1) and said first piston area (4) is connected via one line (9) with said valve unit (11).

17. (NEW) The hydrodynamic torque converter according to claim 16, wherein said line (9) is located in a non-rotatable shaft connected with a stator.

18. (NEW) The hydrodynamic torque converter according to claim 10, wherein a supply line (13) of the pressure medium acting upon said second piston area (5) is located in a non-turnable shaft connected with a stator.